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Assessment of Teaching Methods in Implementation of Competence-Based Medical Education among Lecturers at Kenya Medical Training College

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Abstract

Purpose: Competence-Based Medical Education (CBME) endeavors to develop healthcare professionals with knowledge, skills, and attitudes necessary to meet evolving healthcare demands by promoting critical thinking over memorization. This study aimed at evaluating the use of teaching practices by lecturers in the adoption of Competence-Based Medical Education (CBME) in Kenya Medical Training Colleges (KMTCs).

Methodology: The research utilized a cross-sectional mixed-methods study that focused on the population of about 1,200 KMTC lecturers. Questionnaire respondents (n=205; response rate 91.5) were sampled using stratified and simple random sampling, Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) using purposive sampling. STATA was used to analyze quantitative data; NVivo version 12 was used to analyze qualitative data using thematic analysis.

Findings: Results showed that there was a high adoption of learner-centered practices such as small group's discussion (92%), student participation (80%), integration of theory and practice (79%), simulation and case-based learning (76%), and problem learning (71%). The teaching index was 3.66 (SD=0.80). Teaching and assessment practices highly correlated with each other ($r=0.792$, $p<0.001$). Qualitative data substantiated learner-centered adoption, but demonstrated intrinsic exam-based teaching, inconsistent curriculum implementation, and insufficient CBME-specific faculty training.

Unique Contribution to Theory, Practice and Policy: KMTC should invest in CBME-based faculty development, enhance ICT integration in pedagogy, promote community-based learning, and institutionalize key systematic feedback systems to completely overhaul content-based to competency-based instruction.

Keywords: *Competence Based Medical Education, Competency-Based Curriculum, Competency-Based Assessment, Kenya Medical Training College*

JEL Codes: *I21, I23, I28, M53*

INTRODUCTION

Competence-Based Medical Education (CBME) is a paradigm change in health professions education. It places believes in the education of learners in an outcome-focused curriculum that is learner-centered and no longer time-intensive in comparison to traditional content-heavy-focused curricula. Instead of the quantifiable criteria like seat time or recollection, CBME uses the expressed mastery of core competencies, including clinical skills, critical reasoning, communication, reflective thinking, and professionalism, as the measure of training success (Sulena et al., 2024; Munoz & Araya, 2017). The 2013 International CBME Collaborators (ICBME) summit reaffirmed the need of health professions education to be responsive to the needs of population healthcare with primary focuses on the achievement of well-defined learner outcomes (Anderson et al., 2021). However, implementation issues are still present, especially in sub-Saharan Africa where over 60 percent of medical instructors claim to have inadequate training on CBME principles and assessment techniques (McKenzie-White et al., 2022).

Kenya Medical Training college (KMTC) is the largest national health training institution with a population of over 70,000 students spread out in 90 campuses and producing over 23,000 graduates per year (KMTC, 2023). It provides over 95 percent of the frontline health workers in Kenya (KMTC, 2023). CBME has been a priority of KMTC 2023-2028 Strategic Plan. However, a report by KMPDC (2024) showed that only 38 percent of the faculty were trained in CBME and more than 70 percent had difficulties in measuring competencies because of ineffective tools and institutional assistance. These gaps are particularly urgent since learners who come out of Competency-Based Curriculum (CBC) at the basic level of education in Kenya will start joining KMTC as of 2028. In the absence of well-trained lecturers, there is a huge possibility to bring out graduates who have theoretical knowledge but are unprepared in clinical terms to practice, directly sabotaging the Vision 2030 and Universal Health Coverage (UHC) agenda in Kenya (Muthuri, 2023). This paper, thus, evaluated the instructional practices in CBME implementation in the KMTC lecturers in order to produce evidence to inform the improvement of faculty and policy change.

LITERATURE REVIEW

Faculty Training and Capacity Building

Proper faculty training is a pre requisite to successful implementation of CBME. It has been demonstrated repeatedly that teachers in low- and middle-income schools consider themselves to lack adequate resources to apply the concepts of CBME in practice. Subsequently, the capacity building programs tend to fail when they are short, rarely used, and not aligned with the needs of the institution (Darling-Hammond et al., 2017). Faculty Members need to be proficient in converting competencies into learning objectives, using active teaching strategies and authentic assessment approaches, key aspects of a deliberately developed competency-based faculty development program (Schultz et al., 2023). The implementation of a Faculty Development

Program at KMTC has a history of more than 20 years but minimal appraisal on its effect to the readiness of CBME has been done with a significant gap in evaluation evidence.

Learner-Centered Pedagogical Approaches

CBME needs to make a very strong move towards non-didactic; not teacher based, but rather, interactive, learner centered instruction. This work is based on Social Constructivist Theory (SCT), which highlights the importance of knowledge being actively constructed in a context of social interaction and collaboration with lecturers as a facilitators and scaffolders of learning, rather than content mere deliverers (Leiberman & Kizis, 2026). Commonly supported CBME techniques include Problem-Based Learning (PBL), Case-Based Learning (CBL), Inquiry-Based Learning (IBL), Community-Based Teaching Approach (CBTA), and Simulation-Based Medical Education (SBME) that encourage active and peer learning, critical reflection and knowledge application to clinical scenarios (Trullà et al, 2022; Leiberman & Kizis, 2026).

Technology Integration and Feedback in CBME

The incorporation of ICT into health professions education is becoming a focal point in the 21st century, allowing self-directed learning, blended learning, and increased access to experience (Odigwe & Owan, 2020; Siagian et al., 2020). Formative feedback is also critical, and it is an ongoing coaching process that make a direct connection between observed performance and desired competencies. Feedback must be timely, precise, and practical to have the ability to help learners recognize the gaps in performance and gradually develop competence (Lee & Chiu, 2022; Evans et al., 2019; RangaIyengar & Pitchandy, 2025). When either of the ICT integration or the provision of feedback is lacking, it brings about a big failure in the implementation of CBME.

METHODS

Study Design, Setting and Population

Cross-sectional study design was chosen in the form of a concurrent mixed-method approach, which provided the opportunity to investigate the practices of lecturers at a specific moment and triangulate the quantitative and qualitative data. The research was carried out by covering 24 purposely chosen KMTC campuses that were stratified in all the eight national zones to attain representativeness. All the 18 health training programs provided in KMTC were included in the study population of lecturers.

Sampling

The sample size of 224 was calculated; simple random and stratified sampling was used with the questionnaire respondents. Purposive sampling was used in the selection of participants in six FGDs (three with lecturers as academic or examination officers, three with student representatives) and KIIs with Heads of Department and Deputy Principals (Academic). The quantitative survey did not involve FGD and KII participants.

Data Collection

The data on teaching practices, assessment strategies, resources adequacy, and CBME implementation was collected via a semi-structured Likert-scale questionnaire. All FGDs and KIIs were held over secure web conferencing, were audio-taped with permission and transcribed verbatim. Instrument validity and clarity were improved by a pilot study in KMTC Thika Campus.

Analysis

The analysis of quantitative data was conducted in STATA-descriptive statistics, composite indices, Wilcoxon rank-sum tests, Pearson correlation, and multivariate linear regression were used. NVivo version 12 was used to analyze qualitative types of data thematically.

RESULTS

Response Rate

A total of 205 of 224 sampled respondents completed the questionnaire, giving a response rate of 91.5. The researcher successfully conducted three FGDs with lecturers, three with student representatives, and key informant interviews with heads of departments and deputy principals.

Demographic Characteristics of Respondents

The gender distribution was near-equal, where it stood at 103 males (50.2%) and 102 females (49.8%). Nursing (24) and Clinical Medicine (20) had the largest representation in departments. Qualifications wise, 70% of them possessed bachelor degree, 21% master degree and 9% higher national diploma. The summary of the entire demographic picture of respondents is presented at Table 1.

Table 1: Demographic Characteristics of Respondents

Characteristic		N = 205[1]
Gender		
Male	103(50.2%)	
Female	102(49.8%)	
Department		
Administration		1 (0.5%)
Clinical Medicine		40 (20%)
Community Health		4 (2.0%)
Community Oral Health		5 (2.4%)
Dental Technology		4 (2.0%)
Health Promotion and Community Health		4 (2.0%)
Health Records		12 (5.9%)
Imaging		1 (0.5%)
Medical Engineering		12 (5.9%)
Medical Laboratory Sciences		7 (3.4%)
Medical Social Work		1 (0.5%)
Nursing		49 (24%)
Nutrition and Dietetics		6 (2.9%)
Occupational Therapy		5 (2.4%)
Orthopaedic Technology		6 (2.9%)
Orthotrauma Medicine		5 (2.4%)
Pharmacy		9 (4.4%)
Physiotherapy		1 (0.5%)
Public Health		14 (6.8%)
Radiography		6 (2.9%)
Radiography and Imaging		13 (6.3%)
Age (years)		42.45
Years of experience		9.13

[1]n (%); Mean (SD)

1 [1]Mean (SD)

Teaching Methods: Quantitative Findings

The results indicated a high level of applied competency-based teaching methods among lecturers at KMTC. Most of them have used group discussions (92%), student participation strategies (80%), theory-practice integration (79%), reflective learning (79%), simulation based learning (76%), case based learning (76%) and problem based learning (71%). There was a report of critical thinking approaches by 72% and clinical/hospital-based training by 74%. Conversely, the use of technology in instruction was only reported by 65, self-directed learning facilitation by 67, inquiry-based learning by 60 and community-based learning by 49. The least-reported practice was timely formative feedback provision 44% of the time. Table 2 shows the overall composite indices of CBME implementation with teaching index of 3.66 (SD=0.80) having the highest overall adoption.

Table 2: Composite Scores for CBME Components

Characteristic	**N = 205**[1]
Teaching Index	3.66 (0.80)

[1]Mean (SD)

Correlation and Regression Analyses

The correlation analysis conducted by Pearson showed that teaching methods and assessment strategies are strongly positively correlated (r=0.792, p=0.001), meaning that lecturers who use CBME-appropriate teaching methods tend to use corresponding strategies to assess students. These relationships affirm the interdependence of pedagogy, assessment and resources in successful implementation of CBME. The results are a summary of the correlation in Table 3.

Table 3: Correlation between Teaching, Resources and Assessment Scores

Relationship	**r**	**Strength**	**p-value**
Teaching compared to Assessment	**0.792**	Strong	< 0.001

Pearson's correlation coefficients; all values significant at p < 0.001.

The analysis of linear regression revealed that the teaching score had a statistically significant positive coefficient (r = 0.145, p < 0.05). The regression model is shown in Table 4.

Table 4: Linear Regression Analysis of Factors Associated with CBME Implementation

Variable	Coefficient (SE)	Coefficient..SE.
Teaching Score	0.145* (0.065)	
Observations		202.000
R^2		0.133

Teaching Methods: Qualitative Findings

The quantitative results were supported by qualitative data of FGDs and KIIs, which proved that learner-centered and experience-oriented pedagogies were adopted. The deliberate application of interactive strategies was described by lecturers: "We apply group discussions, class based presentations," "we put students in small groups of no more than 6 so that they take an active part in the learning process" (Lecturer FGD). Return demonstrations and demonstrations were also very common: "We apply case-based learning, demonstrations and role-play, and when we demonstrate we give the students the opportunity to return demonstrations to cement their skills (Lecturer FGD). Students confirmed the importance of these strategies; these techniques are how the teacher demonstrates something and then students make repetition of such demonstrations, which will help students to understand more and be confident about the topic (Student FGD). The linkage between theory and practice also took place in the clinical setting: "We visit the hospital with the lecturer and talk about the condition of the patient, which allows us to relate theory to practice" (Student FGD).

However, qualitative data showed important gaps. Although learner centered method was claimed to be embraced, instructional methods based on examination did persist: "Lecturers would pay more attention to making us ready to exams as opposed to full participation and comprehension, particularly when exams are near (Student FGD). There were also reports on inconsistencies and misalignment in curriculum delivery between that which was taught and that which was examined. The quality of feedback became a major issue: In certain instances, particularly on take-home work, you are not provided with very clear feedback and you are not really aware of your performance (Student FGD). Large classes and scarce equipment were other factors that limited access to effective learning. The key informants identified institutional preparedness lacks: "Introduction of competency-based education at KMTC is a process in progress and we have not had any formal training on competency-based education specifically (KII).

DISCUSSION

Adoption of Learner-Centered Teaching Approaches

The results show a significant trend towards competency-based instruction at KMTC. The high use of group discussions (92%), theory-practice integration (79%), and simulation-based learning (76%) is a good sign of purposeful correspondence to CBME principles. These figures surpass the 73% adoption of simulation-based training reported by Sulena et al. (2024), and are impressive compared to the previously mentioned fact that more than 60% of KMTC lecturers did not consider simulation-based training as a confident one (Kavinya et al., 2023). The overall adoption is also relatively high, as indicated by the composite teaching index of 3.66. Nevertheless, the reduced engagement of community-based training (49% points) implies the lost opportunities to enhance the knowledge of social determinants of health in learners- Confirming Tuitoek (2022) suggestion that community exposure needs to be provided earlier and more frequently. Exam-centered

teaching is an unsifting counter-current, consistent with Hamza et al. (2023), who noted that the reorientation towards competency formation is demanded by the demands.

Technology Integration Gaps

Only 65 percent of those who answered indicated that they used technology in teaching; this further implies that the ICT has yet to be seriously incorporated into the teaching and learning process at KMTC. Per Odigwe and Owan (2020), good use of ICT can significantly improve teaching delivery and professionalism, whereas Kuhlthau et al. (2015) highlight that technology should be a part of learning and not a supplemental resource. With KMTC ready to take in CBC-trained students in 2028, the graduates who are heavily accustomed to using digital settings, this gap is vital. The large investment in ICT infrastructure made by KMTC is easily underutilized without planned pedagogical change.

Feedback Provision Deficits

One of the most critical gaps was reported as timely formative feedback with only 44% of the participants reporting it. Feedback is also known as one of the fundamental CBME pillars, which is supposed to be ongoing, focused, and prompt to facilitate competency growth sequentially (Lee and Chiu, 2022; Sanatani et al., 2020). So, qualitative results supported this gap as students said that feedback was unclear and inadequate more frequently. This is contrary to CBME frameworks where feedback is an on-going coaching process that associates observed performance with anticipated competencies and not an evaluation at the end. The results of the regressions would be informative in this case: The negative coefficient of the teaching score ($b= -0.145$, $p=0.05$) in the full model would mean that high-reported teaching activity, when resources are held constant, does not predict stronger implementation of CBME as compared to high-quality pedagogy, which includes robust feedback.

Gender and Qualification Dimensions

There were no statistically significant differences between teaching, assessment, or resource indices by gender or academic qualification ($p>0.05$ for all comparisons) meaning that the implementation of CBME at KMTC is gender-neutral. The marginal reduction in resource adequacy and influence scores of master-degree holders, which is not statistically significant, points to the fact that the more qualified faculty might be more critical in its resource provision to the institution. This is unlike Dejene et al. (2022) who established significant relationships between teaching competency and age, experience, and professional background in Ethiopian health science colleges indicating that experiential factors can be greater determinants of CBME effectiveness as compared to academic qualifications alone.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

High levels of group discussion, simulation, case-based learning, and theory-practice integration indicate that KMTC lecturers have achieved significant success in moving towards learner-centered, competency-based teaching methods. The high correlation between teaching and assessment (r=0.792) is a confirmation of coherent correspondence between pedagogy and evaluation. Nonetheless, the lack of technological integration, community based learning, and provision of feedback in time, together with the systematic teaching and learning methods exclusively focused on exam regulations and the lack of CBME-specific faculty training evidence that the change to the fully competency-driven learning environment is still underway.

Recommendations

KMTC must invest in creating CBME-specific faculty development programs that go beyond the general teaching methodology training and involve simulation-based pedagogy, inquiry-based learning, community-based teaching practice and structured feedback delivery, in particular, to prepare lecturers to work with newly trained CBC groups. The use of technology in instruction needs to be enhanced majorly: giving lecturers the digital pedagogical skills, enhancing the ICT infrastructure in the campuses, and integrating the digital tools as interactive learning facilitators as opposed to auxiliary providers. A systematic and timely feedback system has to be institutionalized into all the programs and community-based learning opportunities ought to be increased to begin earlier in the training cycle. Lastly, teaching practices and learner outcomes should be monitored and evaluated regularly at campuses to deliver a consistent, evidence-based implementation of CBME.

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Ethics Approval

The Ethics Review Committee of the Amref International University Graduate School gave ethical approval. The research was carried out in accordance with the requirements of the institutional and national ethics of research (Approval reference: SHS/MSHE/794-2/2024). All the respondents had an informed consent and were assured of voluntary participation and confidentiality of their answers.

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